.Bleep.bleep.BLEEP.bLEEP.
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Bleep.EV.Computing's.Bleep.
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E. V. Computing 'Bleep' for 80-BUS computers. Issue 1 Part No. EV 667
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Introduction.

This product is designed to give the Nascom 1 or 2, or the Gemini Intelligent video controller card the capability for audible warning which is similar to the 'Bell' function on a standard terminal. This is achieved by a small printed circuit board which attaches by means of double sided sticky tape to the Nascom or I.V.C. Three connections are required to the actual card, these are: Zero Volts, + 12 Volts and Trigger which is derived from an eight-bit latch on the video card or the six-bit latch of port 0 on the Nascom. Software already exists on the Gemini video card for this function, but on the Nascom machines a small driver program must be loaded first (this can be patched into the display driver routines of Nas-sys if required.)

Warning.

If you do not feel capable of following the fitting details then please get in touch with either your friendly local Distributor or a friend to help you. There is nothing worse than a melted computer. The same advice goes for the adjustment of the values on the 'Bleep' board since it is quite easy to do a lot of damage with a misguided soldering iron!

Guarantee.

This product is guaranteed by the supplier (your Distributor) for one year from the date of purchase. However any fault attributable to incorrect fitting or modification will be fully chargeable with respect to parts and labour.

Fitting * Gemini Intelligent Video Controller *

It is recommended that the additional 'Bleep' circuit board is mounted in close proximity to the key-way of the edge connector. It will be noted that I.C. numbers 22,27 and 32 provide an excellent mounting platform for the 'Bleep'. Three pads of the double-sided tape supplied should be applied to the top surfaces of the above mentioned I.C.'s and the 'Bleep' board stuck onto these with the audible warning device away from the edge- connector, I.E. the terminal pins closest to the edge-connector.

Using the wire & sleeving provided, make the three following connections:-

i) Using two inches of black wire, connect pin two (0 volts) to the negative terminals of capacitors 55 & 56 (situated at the key-way of the edge-connector).

ii) Using two inches of pink wire, connect pin three (+12 volts) to the positive terminal of capacitor 56.

iii) Using eight inches (or less) of brown wire, connect pin one (trigger) of the bleep board to pin 19 of I.C. 25 (near the Z80).

Fitting * Nascom 2 CPU board *

First of all, find a suitable mounting place for the 'bleep' board. Two main possibilities exist, one is to mount the board on some of the ICs in the cassette interface (ICs 21,27,30 & 31), alternatively the board could be mounted on the keyboard especially if this is remote from the main unit. The only disadvantage of being on the keyboard is that there is no +12 volt supply available and so reduced volume from the bleep must be tolerated but this probably will not worry anyone. In fact the reduced noise may be appreciated!

Using the wire & sleeving provided, make the three following connections:-

	Main board mounting	Keyboard mounting
i)	With a short length of the black wire, connect pin 2 of the bleep to pin 8 of IC 24. (0 volts)	With a short length of the black wire, connect pin 2 of the bleep to pin 7 of one of the 7400's.
ii)	Using a length of the pink wire, connect pin 3 of the bleep to the emitter of transistor 2. (+ 12 volts)	Using a length of the pink wire, connect pin 3 of the bleep to pin 14 of the 7400. (+ 5 volts)
iii)	With a short length of the brown wire, connect pin 1 of the bleep to pin 7 of IC 24. (trigger)	With a short length of the brown wire, connect pin 1 of the bleep to pin 8 of the keyboard plug. (the socket is on the cable !)

Nascom software listing.

Below is an assembler output listing to be used when the bleep is connected to a Nascom system. It is located at 0D00 hex but should be moved to a convenient place in your memory map.

```
Polyzap V2.0    Disc assembler       BLEEP driver programme (C) 1982 by S. Wood.
0004            BON     EQU 00000100B   ;Bit pattern to trigger bleep
0000            BOFF    EQU 00000000B   ;Bit pattern to un-trigger bleep
0C71            STAB    EQU 0C71H       ;Address of subroutine table store
0082            CONST   EQU 82H         ;Offset of first entry in table
0007            BELL    EQU 7H          ;Trigger character (control G)
0080            LENGTH  EQU 80H         ;Length of subroutine table
0065            CRT     EQU 65H         ;Subroutine address to be modified
0D00                    ORG 0D00H       ;Start of programme
0D00 2A 71 0C   START   LD HL,(STAB)    ;get old table address
0D03 22 CC 0D           LD (STORE),HL   ;and save for reference.
0D06 11 82 00           LD DE,CONST     ;find real start
0D09 19                 ADD HL,DE       ;and move the table to a
0D0A 11 4C 0D           LD DE,NEWTAB    ;new destination.
0D0D D5                 PUSH DE
0D0E 01 80 00           LD BC,LENGTH
0D11 ED B0              LDIR
0D13 E1                 POP HL          ;retrive Newtab address
0D14 3E 65              LD A,CRT        ;calculate entry that is
0D16 D6 41              SUB 41H         ;to be altered.
0D18 17                 RLA
0D19 85                 ADD A,L
0D1A DC 3A 0D           CALL C,INCH     ;bump H reg if carry
0D1D 6F                 LD L,A
0D1E 11 4A 0D           LD DE,RETADR    ;patch return address of
0D21 7E                 LD A,(HL)       ;the intercept programme
```

```
0D22 12              LD (DE),A      ;to the old $CRT address.
0D23 23              INC HL
0D24 13              INC DE         ;and put new $CRT address
0D25 7E              LD A,(HL)      ;in place of the old one.
0D26 12              LD (DE),A
0D27 11 3C 0D        LD DE,NEWCRT
0D2A 72              LD (HL),D
0D2B 2B              DEC HL
0D2C 73              LD (HL),E
0D2D 11 4C 0D        LD HL,NEWTAB   ;Place new subroutine table
0D30 11 82 00        LD DE,CONST    ;address in Nas-Sys workspace
0D33 ED 52           SBC HL,DE
0D35 22 71 0C        LD (STAB),HL   ;then return to monitor
0D38 DF 5B           SCAL ZMRET
0D3A 24        INCH  INC H          ;silly little subroutine to
0D3B C9              RET            ;increment H register
0D3C FE 07     NEWCRT CP BELL       ;the actual intercept routine.
0D3E 20 09           JR NZ,EXIT     ;when the A reg. contains a bell
0D40 3E 04           LD A,BON       ;character, output bit 2 (04hex)
0D42 D3 00           OUT (0),A      ;is toggled on port 0
0D44 3E 00           LD A,BOFF      ;the A reg. is then cleared so
0D46 D3 00           OUT (0),A      ;no character is displayed
0D48 AF              XOR A
0D49 C3        EXIT  DEFB 0C3H
0D4A 00 00     RETADR DEFS 2        ;return address is patched here
0D4C + 0080    NEWTAB DEFS LENGTH   ;Table is copied here
0DCC + 0002    STORE  DEFS 2
               ;END
```

User-adjustable parts.

There are four resistors that the user may wish to alter that affect the sound of the 'Bleep', these are detailed below:-

Duration (Resistor 3)

A value of 3.9 megohms is fitted as standard which gives an approximate duration of 0.2 seconds. The range of adjustment is from less than 100 kilohms (for a 5 milli-second bleep!) to over 10 megohms which will give a bleep of about 0.55 seconds long.

Modulation frequency (Resistor 4)

A value of 560 kilohms is fitted as standard which modulates the output frequency at about 2 Hertz (Cycles per second). The range of adjustment is from about 47 kilohms to approximately half the value chosen for resistor 3. This will give a modulation rate of around 20 Hertz to about half the duration (giving a single blast of each tone).

Tone frequency (Resistor 5)

A value of 15 kilohms is fitted as standard which will give a tone of approximately 300 hertz. The value can be adjusted from 1 kilohm (approx 3 kilohertz tone) to about 47 kilohms (around 100 hertz).

Modulation depth (Resistor 6)

A value of 10 kilohm is normally fitted which raises the tone by a factor of about 2.5 when the modulating oscillator cycles. This resistor can be ommited if a single unmodulated tone is desired from the 'Bleep' and use resistor 5 to set the frequency.

Theory of operation.

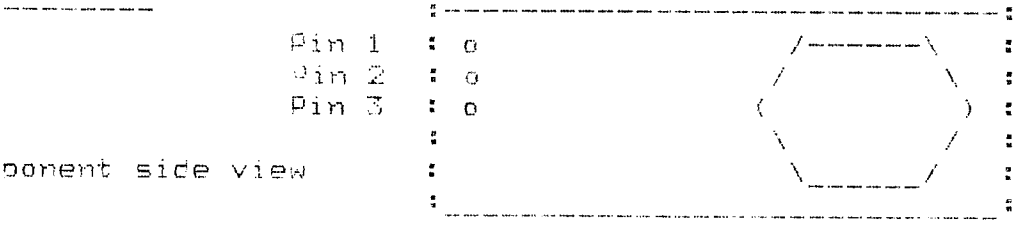
When the potential on the trigger pin exceeds 0.6 volts then transistor one is forced into conduction thus lowering its collector terminal to zero volts, this signal is inverted by gate A in the quad Nor gate package. This signal is in turn used to trigger a monostable configured around two Nor gates whose time-constant is derived from the combination of capacitor three and resistor three. The timed pulse from the monostable enables two gated oscillator made up from two pairs of Schmitt input Nand gates. The first oscillator runs at a relatively low frequency and is used to modulate the second oscillator which produces the audio tone. A piezo crystal type transducer is the actual audible noise-maker, to ensure maximum output level coupled with low current drain it is driven with complementary signals from an inverting gate so it receives the full voltage swing of the twelve volt power supply.

Component list

	Reference	Value/Number	Type	Tolerence
Resistors:	R 1 and R 2	220 kilohm	ISKRA UPM033	5 %
	R 3	3.9 megohm	ISKRA UPM033	5 %
	R 4	560 kilohm	ISKRA UPM033	5 %
	R 5	15 kilohm	ISKRA UPM033	5 %
	R 6	10 kilohm	ISKRA UPM033	5 %
	R 7	1 megohm	ISKRA UPM033	5 %
Capacitors:	C 1	0.047 uF	Siemens B37449	20 %
	C 2, C 3 and C 4	0.1 uF	Siemens B32560	5 %
Transistors:	TR 1 and TR 2	BC182	NPN silicon	
Diodes:	D 1 to D 4	1N4148	Silicon	
I.C.'s:	IC 1	CD4001	B-series CMOS	
	IC 2	CD4093	B-series CMOS	
Transducer:	X 1	PB 2720	Piezo-ceramic	

Also supplied: Three 8 inch lengths of black, pink, brown wire and three insulating sleeves. Three pads of thick double-sided tape.

BLEEP PIN-OUT



S.W. 300782 R1.2

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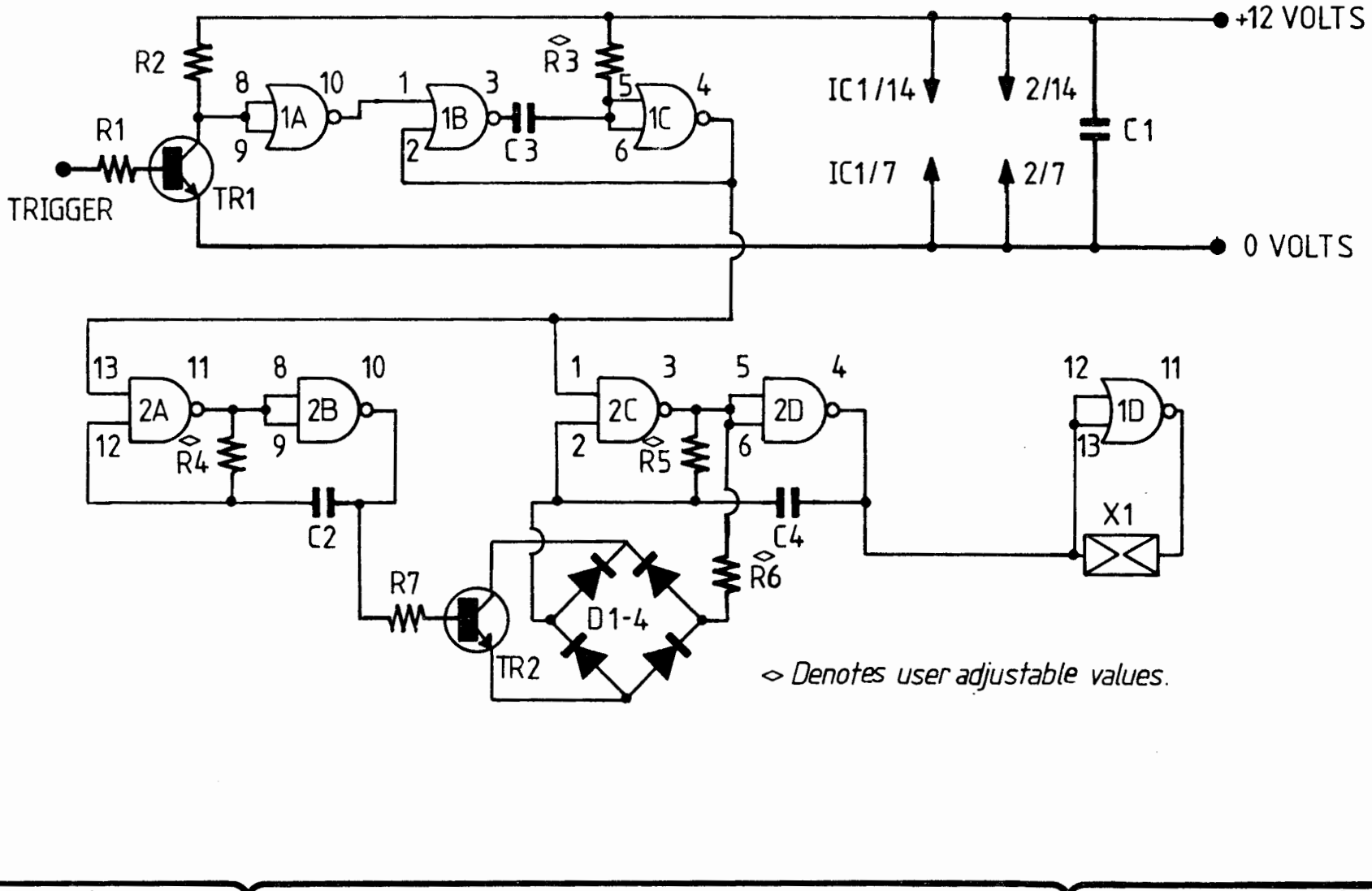

DRAWN BY S. Wood
DATE 30/7/82 MOD 00
SHEET 1 OF 1

'BLEEP'

For Gemini I.V.C. card

DRAWING NO. 002
SCALE 1:1
PART NO. EV667

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